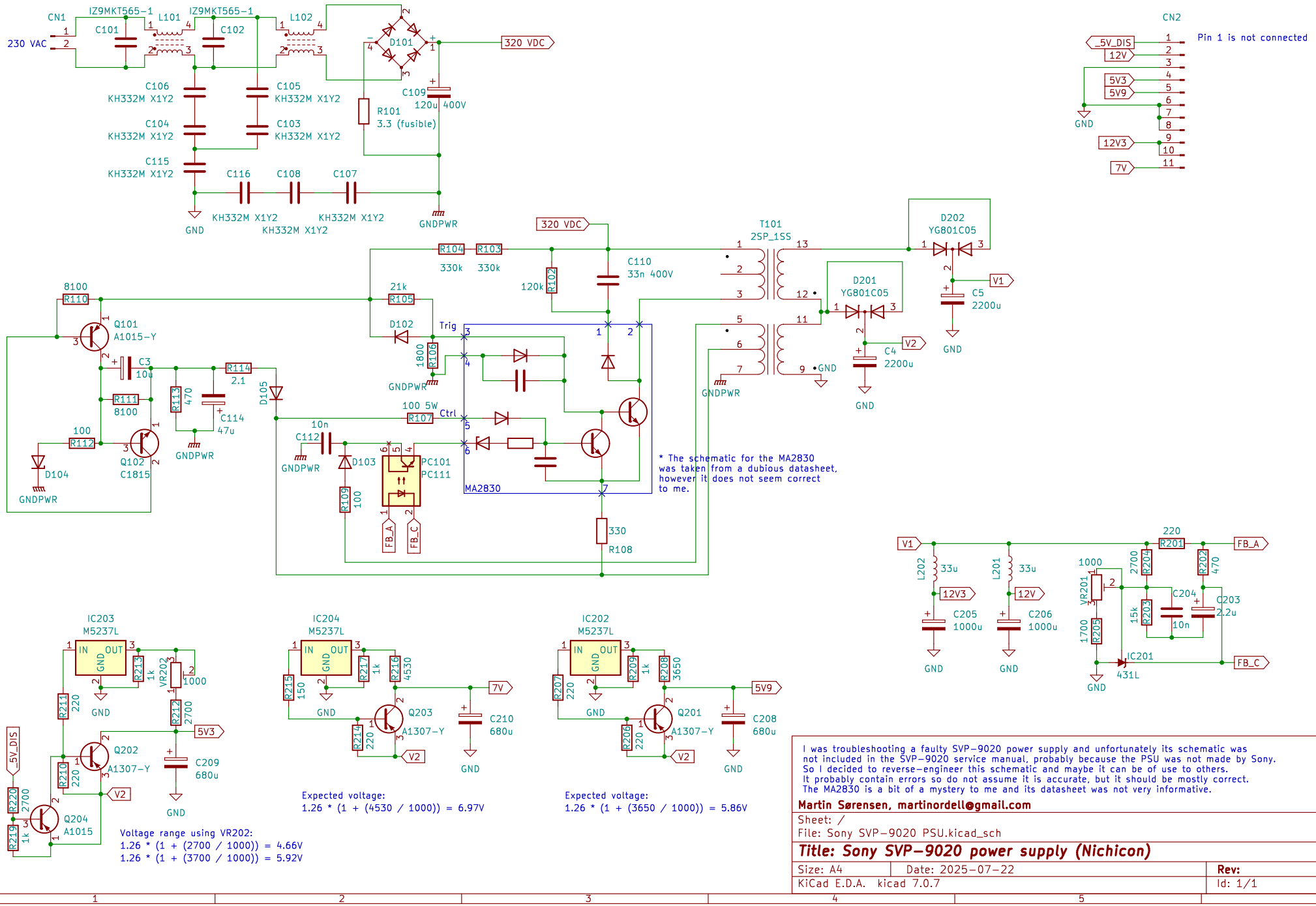


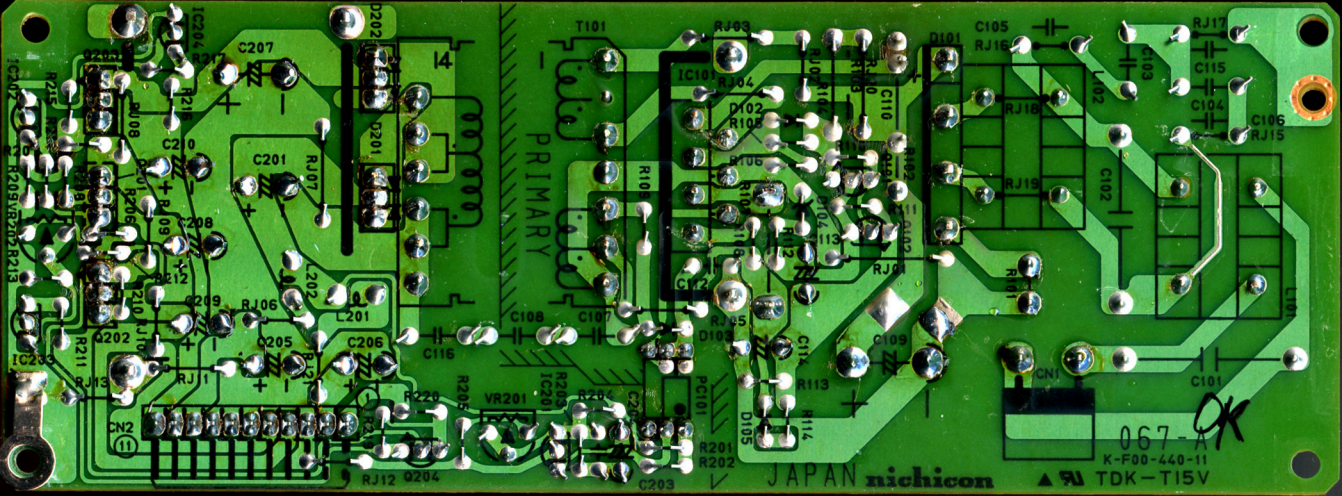
I was troubleshooting a faulty SVP-9020 power supply and unfortunately its schematic was not included in the SVP-9020 service manual, probably because the PSU was not made by Sony. So I decided to reverse-engineer this schematic and maybe it can be of use to others. It probably contain errors so do not assume it is accurate, but it should be mostly correct. The MA2830 is a bit of a mystery to me and its datasheet was not very informative.

Martin Sørensen, martinordell@gmail.com

Sheet: /
File: Sony SVP-9020 PSU.kicad_sch

Title: Sony SVP-9020 power supply (Nichicon)

Size: A4	Date: 2025-07-22	**Rev:**
KiCad E.D.A. kicad 7.0.7		Id: 1/1


PRIMARY
T101
IC101
IC201
IC202
IC203
IC233
Q201
Q202
Q204
D101
D102
D103
D105
CN1
CN2
VR201
PC101
C101
C102
C103
C104
C105
C106
C107
C108
C109
C110
C115
C116
C201
C205
C206
C207
C208
C209
C210
L101
L102
L201
L202
RJ01
RJ03
RJ04
RJ06
RJ07
RJ08
RJ09
RJ12
RJ13
RJ15
RJ16
RJ17
RJ18
RJ19
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R250
R251
R252
R253
R254
R255
R256
R257
R258
R259

SHINDENGEN

Power Switching Regulators

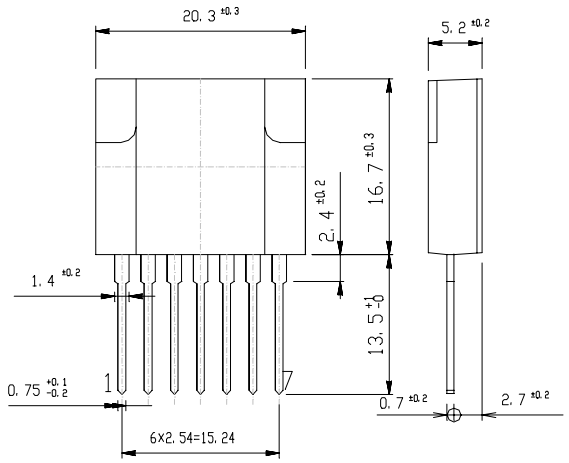
MA2000 Series

MA2830

OUTLINE DIMENSIONS

Case : MA7

Unit : mm



RATINGS

●Absolute Maximum Ratings

Item	Symbol	Conditions	Ratings		Unit
			P Class	N Class	
Storage Temperature	Tstg		−30～125	−30～125	℃
Operating Temperature	Top	Case Temperature	−20～125	−20～125	℃
Junction Temperature	Tj		150	150	℃
Peak Input Voltage	Vin	②+,④−,Fig.1 is Measurement Circuit of Peak Input Voltage Vin and Collector Cutoff Current I_{CEX}.	850	850	V
Input Current	Iin	Pulse Pulse Width 150 μs MAX, Duty1/2, Sawtooth Wave, Peak Value, ②+,④−	8	8	A
Maximum Operating Frequency	f(max)		200	200	kH_Z
Maximum Power Dissipation	P_D	Ta=25℃	3	3	W
	P_D	Heatsink Tc=100℃	22	22	W
Dielectric Strength	Vdis	Terminals To Case AC 1 min	2	2	kV
Insulation Resistance		Terminals To Case 500VDC	100	100	MΩ
Fold Back Control Voltage	V_{CONT}(max)	Fold Control Resistance=0Ω Duty 1/2, ④,⑦	±8	±8	V
Fold Back Control Current	I_{CONT}(max)	④−,⑥+	100	100	mA

●Electrical Characteristics (Tc=25℃)

Item		Symbol	Conditions	Ratings		Unit
				P Class	N Class	
Q1	Collector Cutoff Current	I_{CEX}	V_{CE}=850V,Fig.1 is Measurement Circuit of Peak Input Voltage Vin and Collector Cutoff Current I_{CEX}. , ②+,④−	MAX 0.1	MAX 0.1	mA
	DC Current Gain	h_{FE}	V_{CE} = 5V, I_C = 3.0A, ②+,④−,⑤I_B	13～26	8～16	
	Collector to Emitter Saturation Voltage	V_{CE}(sat)	I_C=3.0A, I_B=0.6A, ②+,④−,⑤I_B	MAX 1.0	MAX 1.0	V
	Thermal Resistance	θ jc	Junction to Case	MAX 2.26	MAX 2.26	℃/W
D1	Reverse Current	I_R	V_R=800V,①+,②−	MAX 10	MAX 10	μA
	Forward Voltage	V_F	I_F=0.6A,①−,②+	MAX 1.7	MAX 1.7	V
Driving Saturation Voltage		V_D(sat)	I_C=1.5A, I_B=0.3A, ⑤ +,④ −	MIN 1.7 MAX 2.3	MIN 1.7 MAX 2.3	V

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●Standard Operating Condition・Design Standard For Application Circuit

Item	Conditions	Ratings		Unit
		P Class	N Class	
Input Rated Voltage		AC90～274	AC90～274	V
Output Nominal Wattage		50	50	W
Output Nominal Voltage		12	12	V
Output Nominal Current		4	4	A

●Standard Operating Condition・Standard Operating Characteristics （Ta=25℃）

Item		Conditions	Ratings		Unit	
			P Class	N Class		
Minimum Input Full Load Output Voltage		Vin=90V, I_O=4A	12.0±0.6	12.0±0.6	V	Fig 2, ① Refer
Maximum Input Light Load Output Voltage		Vin=274V, I_O=0.4A	12.0±0.6	12.0±0.6	V	Fig 2, ② Refer
AC Input Voltage		I_O=4A	MAX 85	MAX 85	V	
Over Current Protection	Foldback Current	Vin=274V, V_O=10V	MAX 7	MAX 7	A	Fig 2, ③ Refer
	Short Circuit	Vin=274V, R_O=0.5Ω	Nodamage To Any Device, Automatic Recovery.		–	Fig 2, ④ Refer
Output Ripple Noise		Vin=90～274V, I_O=0.4～4A	MAX 150	MAX 150	mV P-P	

Figure in ○=Terminal Sign

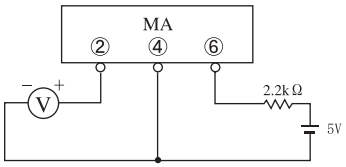

Fig1. Measurement Circuit

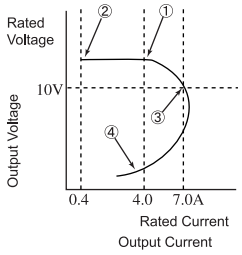

Fig2. Output Voltage/Current

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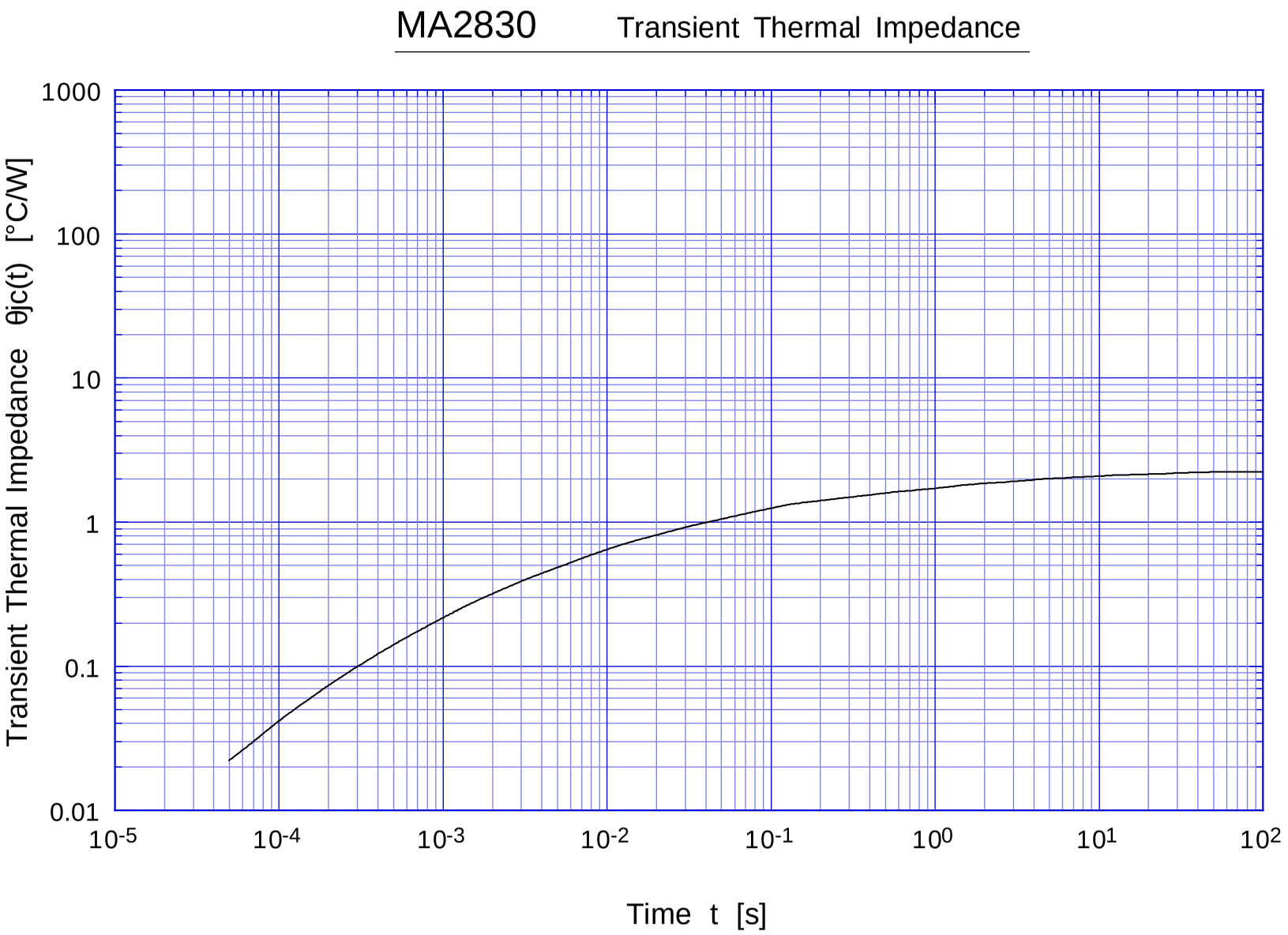
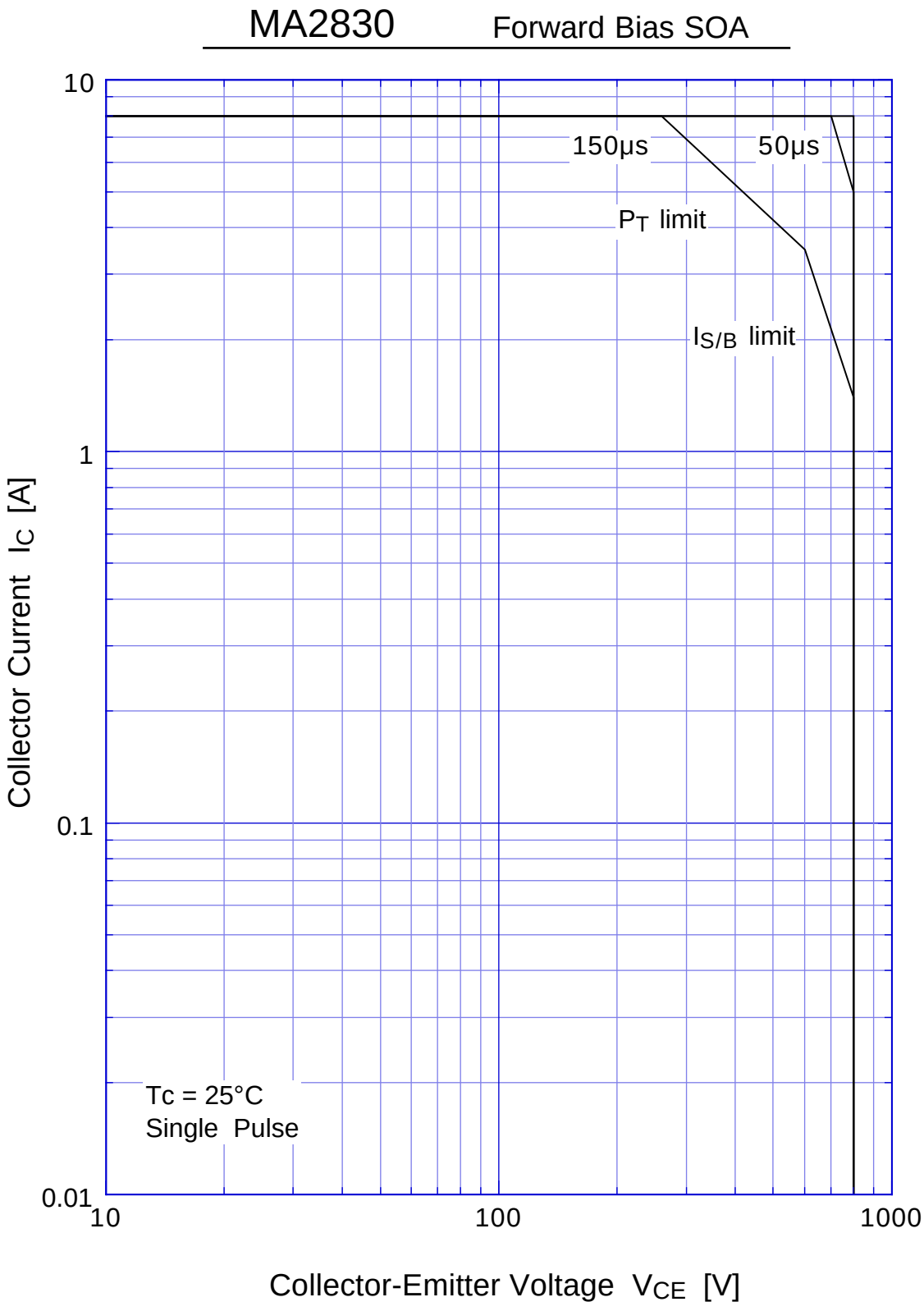
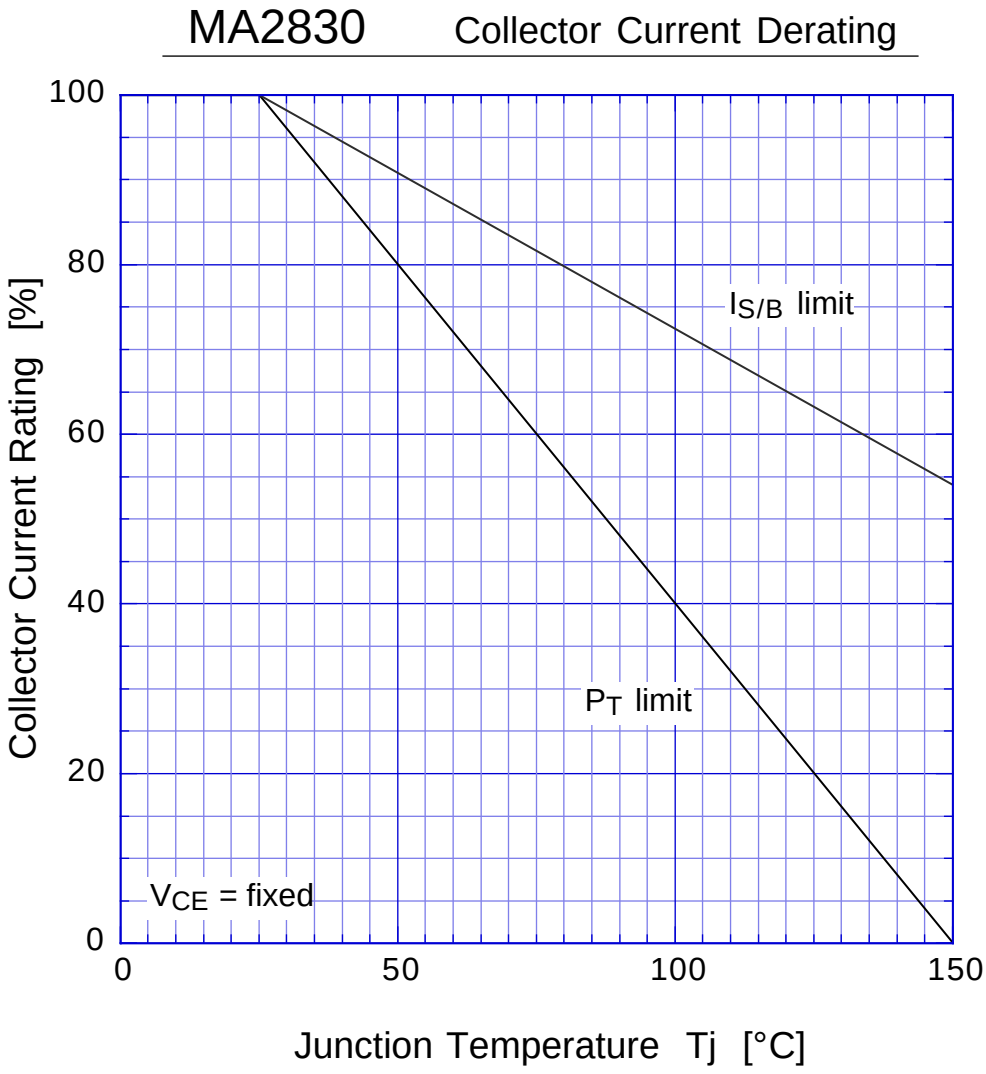
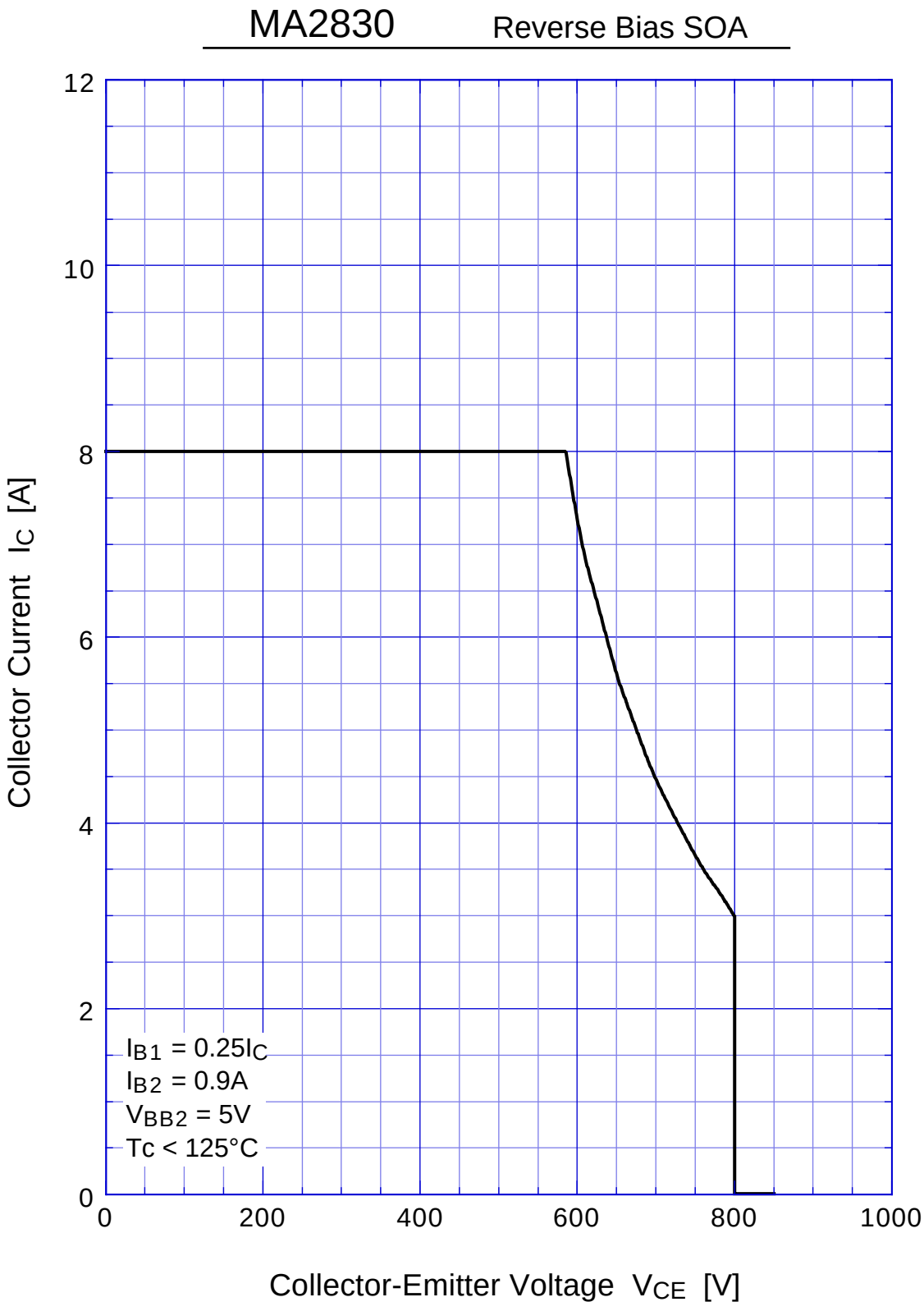
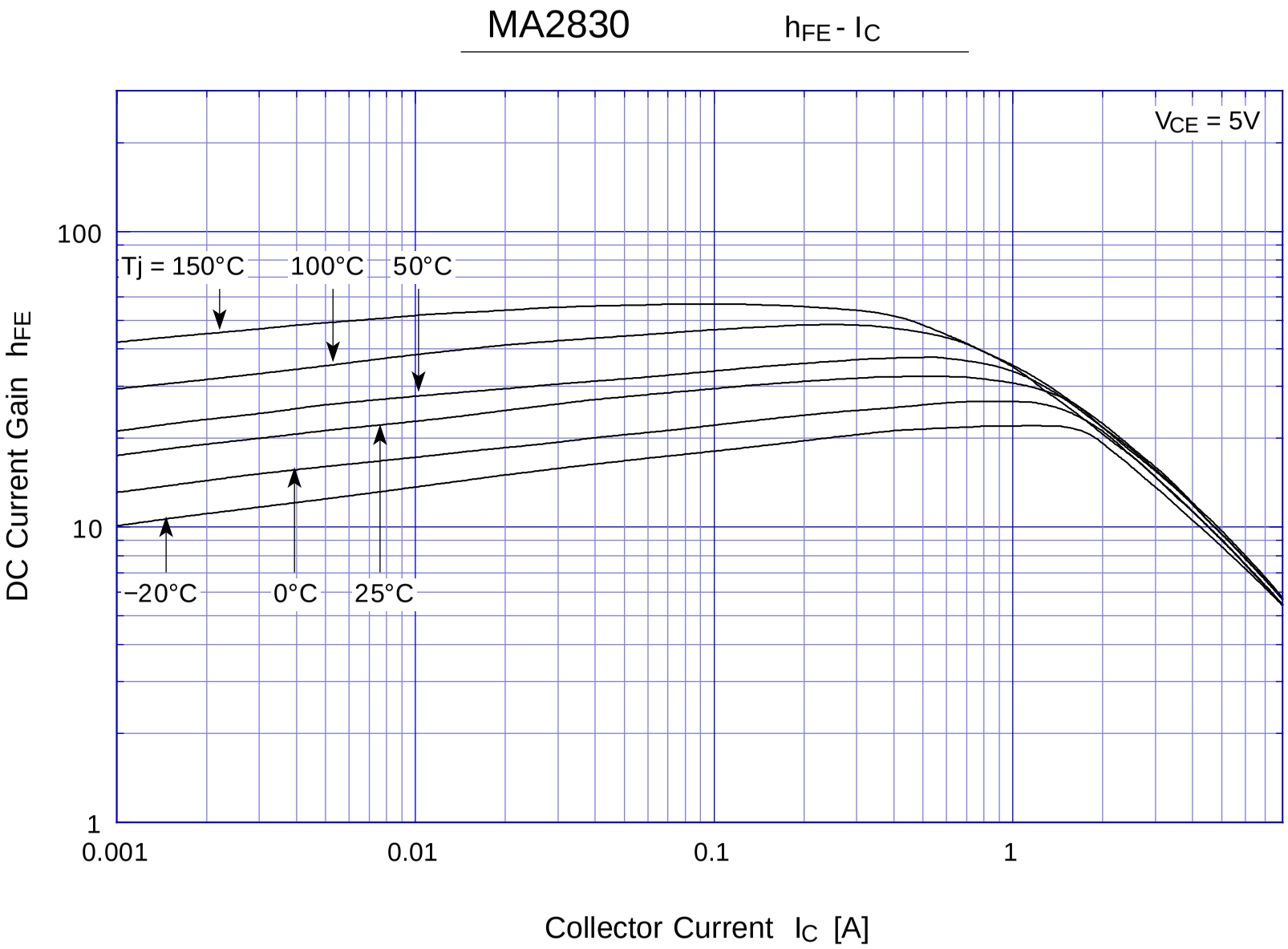

MA2830
Transient Thermal Impedance
Transient Thermal Impedance θjc(t) [°C/W]
1000
100
10
1
0.1
0.01
10-5
10-4
10-3
10-2
10-1
100
101
102
Time t [s]


MA2830
Forward Bias SOA
10
1
0.1
0.01
150µs
50µs
P_T limit
$I_{S/B}$ limit
Tc = 25°C
Single Pulse
Collector Current I_C [A]
10
100
1000
Collector-Emitter Voltage V_{CE} [V]

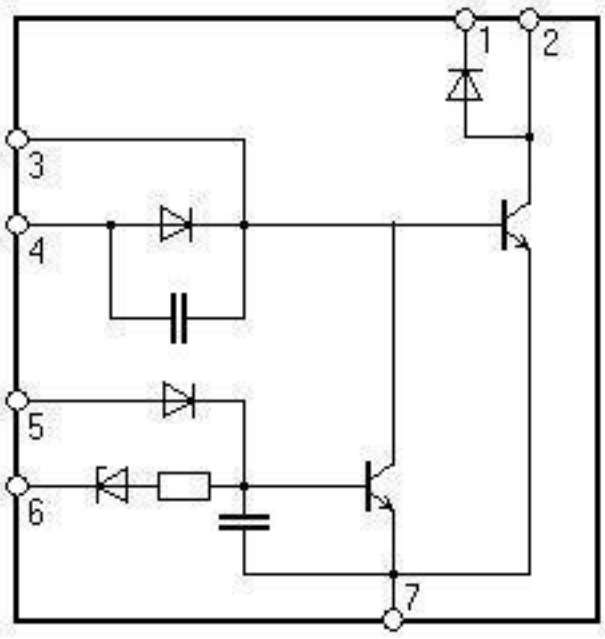

MA2830
Collector Current Derating
100
80
60
40
20
0
Collector Current Rating [%]
0
50
100
150
Junction Temperature Tj [°C]
IS/B limit
PT limit
VCE = fixed

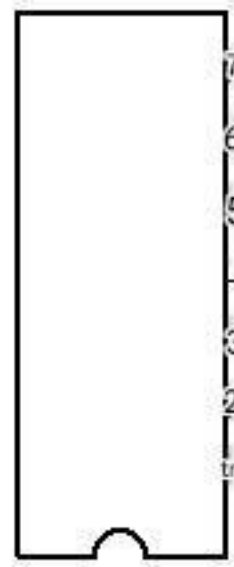

MA2830
Reverse Bias SOA
12
10
8
6
4
2
0
0
200
400
600
800
1000
Collector Current I_C [A]
Collector-Emitter Voltage V_{CE} [V]
I_{B1} = 0.25I_C
I_{B2} = 0.9A
V_{BB2} = 5V
Tc < 125°C


MA2830
hFE - IC
VCE = 5V
Tj = 150°C
100°C
50°C
−20°C
0°C
25°C
100
10
1
0.001
0.01
0.1
1
DC Current Gain hFE
Collector Current IC [A]

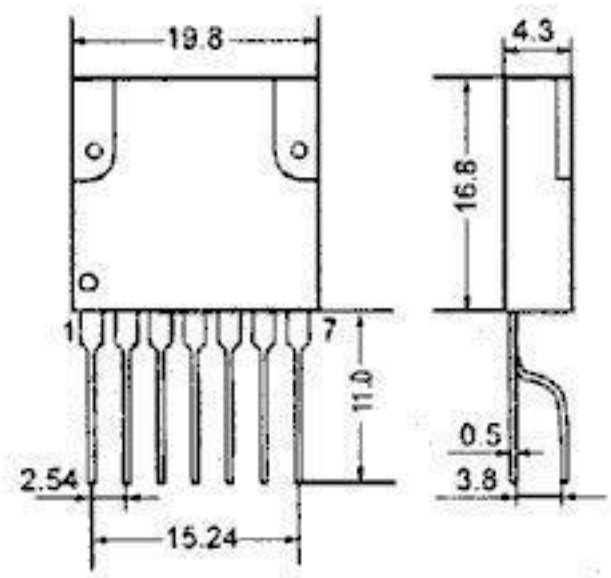
MA2830 - PWM controller with built-in power switch for pulse power supplies.

Functions performed: measuring amplifier, power switching transistor.





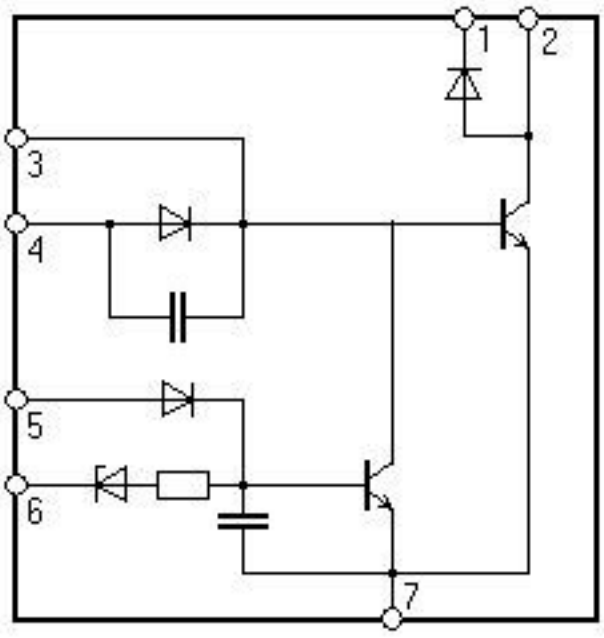
7 Primary circuit body, power key
transistor emitter
6. Input of voltage limiting circuit
5. Control voltage input
4 Feedback voltage input
3. Trigger pulse input
2. Collector of the power key
transistor 1. Cathode of the power limiting diode



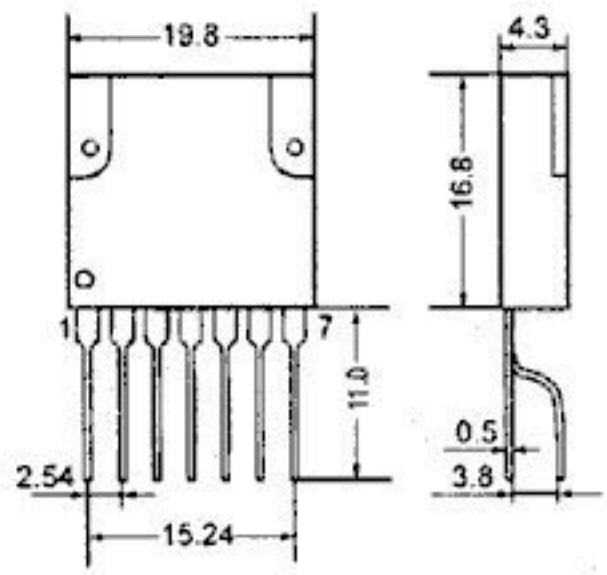
Chip type MA2830	
Manufacturer Shindingen	
Functional features PWM controller with built-in power switch for pulse power supplies	
FRAME	SIP6(7pin)

MA2830 - Шим-контроллер со встроенным силовым ключом для импульсных БП

Выполняемые функции: измерительный усилитель, силовой ключевой транзистор.



7 Корпус первичной цепи, эммитер силового ключевого транзистора
6 Вход схемы ограничения напряжения
5 Вход управляющего напряжения
4 Вход напряжения обратной связи
3 Вход импульса запуска
2 Коллектор силового ключевого транзистора
1 Катод силового ограничительного диода



Тип микросхемы	MA2830
Фирма производитель	Shindingen
Функциональные особенности	Шим-контроллер со встроенным силовым ключом для импульсных БП
КОРПУС	SIP6(7pin)